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~~C-O-N-F-I-D-E-N-T-I-A-L~~
INFORMATION REPORT

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25X1

PREPARED AND DISSEMINATED BY

CENTRAL INTELLIGENCE AGENCY

COUNTRY

Hungary

ARMY review completed.

SUBJECT

Miscellaneous Information on Coal Mines and the Inota Power Plant

USAF review completed.

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SUPPLEMENT TO REPORT #

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THIS IS UNEVALUATED INFORMATION

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This report is the result of a joint collection effort by the Air Force, the Army and CIA and is disseminated in accordance with the provisions of NSCID #7.

1. Aerial cables, recently constructed by Belcher, an East German firm, transport coal to the washing, cleaning and grading plant in Varpalota from nearby mines. From this point, crushed coal is delivered via aerial cable to the power plant at Inota, and another cableway carries coal to the Pet Nitrogen Works.
2. The Inota power plant has two cooling towers, each constructed of ferro-concrete, about 40 meters high, with a ground diameter of about 30 meters, tapering to approximately 15 meters at the top.
3. The water pumps at the Dorog mines must be kept in continuous operation. The daily quantity of water pumped from the mines equals the daily coal production.
4. The pumps used for pumping water from the new shaft at Komlo, are designed to pump water at a minimum rate of two meters per second. There are six pumps, three in operation and three on standby.
5. At Komlo, the power plant, machine shop, sawmill and coal grading plant are located at the head of and on the south side of the railroad. The sawmill and machine shops were constructed in 1954. Ten to 12 parallel tracks under the coal classifier enable simultaneous loading of cars on each of the tracks.

6. [] the coal and uranium miners continued fighting after the fighting in Budapest had ceased and that the Uranium miners damaged or destroyed the uranium mine shafts.

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[] following items of possible interest:

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1. Engineer drawing of a German (East Berlin) designed and manufactured pump for the 600-meter shaft at Komlo.
2. Engineer drawing of the types of pumps made by the Dorog Mining and Equipment Enterprise.
3. Aid for planning piping for keeping velocities under three meters per second - a chart.
4. Types of high voltage motors made by Klement Gottwald (formerly Ganz) Works in Budapest, - a chart.
5. Aid for quick calculation of pumping costs and energy requirements - a chart.
6. Aid for mine ventilation calculations - a chart. All are UNCLASSIFIED.]

-end-

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3

Q m³/óra és Q m³/perc vízmennyiség és 100 m egyenes csövezetek h_v m.v. ellenállásának táblázata

SEGÉDTÁBLA

Q m³/sec m/sec		a c s ö v e z e t e k										b e i v i l ú g a m m										v m/sec
		40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350	400	450	500		
0.50	Q m³/sec	0.018	0.029	0.040	0.051	0.061	0.071	0.081	0.097	0.110	0.121	0.131	0.143	0.153	0.163	0.173	0.183	0.193	0.203	0.213	0.223	
	h _v m	2.3	3.5	5.1	6.9	9.1	11.5	14.1	22.1	31.8	43.3	56.6	71.6	88.4	107	127	173	225	286	353		
	h _v m	1.0	0.50	0.65	0.84	0.96	0.90	0.80	0.56	0.29	0.21	0.19	0.15	0.14	0.13	0.12	0.10	0.089	0.077	0.067	0.060	
0.60	Q m³/sec	0.015	0.027	0.038	0.048	0.058	0.068	0.078	0.094	0.107	0.119	0.130	0.141	0.151	0.161	0.171	0.181	0.191	0.201	0.211	0.221	
	h _v m	2.7	4.2	6.1	8.3	10.9	13.7	17.0	26.5	38.2	52.0	67.9	85.9	106	130	158	210	273	346	429		
	h _v m	1.5	1.12	0.90	0.75	0.65	0.57	0.50	0.39	0.32	0.27	0.23	0.21	0.19	0.16	0.15	0.12	0.11	0.096	0.086		
0.70	Q m³/sec	0.013	0.023	0.034	0.044	0.054	0.064	0.074	0.090	0.103	0.115	0.126	0.136	0.146	0.156	0.166	0.176	0.186	0.196	0.206	0.216	
	h _v m	3.2	5.0	7.1	9.7	12.7	16.0	19.8	31.0	44.5	60.6	79.2	100	124	150	178	242	317	401	495		
	h _v m	1.9	1.5	1.2	1.0	0.86	0.75	0.67	0.52	0.43	0.36	0.31	0.27	0.24	0.22	0.20	0.17	0.15	0.13	0.12		
0.80	Q m³/sec	0.011	0.020	0.030	0.040	0.050	0.060	0.070	0.086	0.099	0.111	0.122	0.132	0.142	0.152	0.162	0.172	0.182	0.192	0.202	0.212	
	h _v m	3.6	5.7	8.1	11.1	14.5	18.3	23.6	35.3	50.7	69.3	92.5	120	153	192	237	320	415	522	641		
	h _v m	2.5	1.9	1.5	1.3	1.1	0.99	0.86	0.67	0.55	0.46	0.40	0.35	0.31	0.28	0.26	0.22	0.19	0.17	0.15		
0.90	Q m³/sec	0.009	0.017	0.025	0.033	0.041	0.049	0.057	0.069	0.080	0.090	0.100	0.110	0.120	0.130	0.140	0.150	0.160	0.170	0.180	0.190	
	h _v m	4.1	6.4	9.2	12.5	16.3	20.6	25.5	39.8	55.3	75.9	102	133	170	214	265	360	465	582	711		
	h _v m	3.0	2.4	1.9	1.6	1.4	1.2	1.1	0.84	0.69	0.58	0.50	0.44	0.39	0.36	0.32	0.27	0.24	0.21	0.19		
1.00	Q m³/sec	0.0075	0.014	0.021	0.028	0.035	0.042	0.049	0.059	0.068	0.076	0.084	0.092	0.100	0.108	0.116	0.124	0.132	0.140	0.148	0.156	
	h _v m	4.5	7.1	10.2	13.9	18.1	22.9	28.3	44.2	63.6	86.6	113	143	177	214	254	346	452	573	707		
	h _v m	3.7	2.9	2.3	2.0	1.7	1.5	1.3	1.0	0.84	0.71	0.61	0.54	0.48	0.44	0.40	0.34	0.29	0.26	0.23		
1.25	Q m³/sec	0.005	0.009	0.014	0.020	0.026	0.032	0.037	0.046	0.053	0.060	0.067	0.073	0.079	0.085	0.091	0.100	0.108	0.116	0.124	0.132	
	h _v m	5.7	8.8	12.8	17.3	22.6	28.6	35.4	55.2	79.5	106	141	179	227	287	358	474	605	752	907		
	h _v m	5.6	4.3	3.5	3.0	2.6	2.3	2.0	1.5	1.3	1.1	0.94	0.83	0.74	0.67	0.61	0.52	0.45	0.40	0.35		
1.50	Q m³/sec	0.0035	0.007	0.011	0.015	0.020	0.024	0.028	0.035	0.041	0.047	0.052	0.057	0.062	0.067	0.072	0.079	0.085	0.091	0.097	0.103	
	h _v m	6.8	10.6	15.3	20.8	27.1	34.4	42.4	66.3	95.4	130	170	215	265	321	382	520	679	859	1060		
	h _v m	7.6	6.1	5.0	4.2	3.6	3.2	2.8	2.2	1.6	1.5	1.3	1.2	1.1	0.96	0.87	0.74	0.64	0.57	0.51		
1.75	Q m³/sec	0.0025	0.005	0.007	0.010	0.013	0.016	0.019	0.024	0.028	0.032	0.036	0.040	0.044	0.048	0.052	0.058	0.063	0.068	0.073	0.078	
	h _v m	7.9	12.4	17.8	24.3	31.7	40.1	49.5	73.3	110.6	152	198	250	307	374	445	606	792	1002	1237		
	h _v m	10.5	8.1	6.6	5.7	4.8	4.3	3.8	3.0	2.4	2.1	1.9	1.6	1.4	1.3	1.2	0.99	0.86	0.75	0.69		
2.00	Q m³/sec	0.0015	0.003	0.005	0.007	0.009	0.011	0.013	0.016	0.019	0.022	0.025	0.028	0.031	0.034	0.037	0.042	0.046	0.050	0.054	0.058	
	h _v m	9.1	14.1	20.4	27.7	36.2	45.8	56.3	84.8	123	173	226	286	354	428	509	693	905	1145	1414		
	h _v m	13.4	10.5	8.6	7.2	6.2	5.5	4.8	3.8	3.2	2.8	2.4	2.1	1.9	1.7	1.5	1.3	1.1	0.99	0.88		
2.50	Q m³/sec	0.0008	0.0015	0.002	0.003	0.004	0.005	0.006	0.008	0.009	0.010	0.011	0.012	0.013	0.014	0.015	0.017	0.019	0.021	0.023	0.025	
	h _v m	11.3	17.7	25.8	34.6	45.2	57.3	70.7	110	159	216	283	358	442	535	636	866	1131	1431	1767		
	h _v m	20.5	16.0	13.1	11.1	9.6	8.4	7.5	5.9	4.9	4.1	3.6	3.2	2.9	2.6	2.4	2.0	1.7	1.5	1.4		
3.00	Q m³/sec	0.0007	0.0013	0.002	0.003	0.004	0.005	0.006	0.008	0.009	0.010	0.011	0.012	0.013	0.014	0.015	0.017	0.019	0.021	0.023	0.025	
	h _v m	13.6	21.2	30.5	41.6	54.3	68.7	84.8	133	191	260	339	429	530	641	763	1039	1367	1710	2124		
	h _v m	23.8	24.7	18.6	15.8	13.6	11.8	10.7	8.4	6.9	5.9	5.1	4.5	4.1	3.7	3.4	2.9	2.5	2.2	2.0		

Könyökarabok és elzárószerkezetek ellenállástényezője; ellenállás: h_v = $\xi \frac{v^2}{2g}$ m.v.o.

h _v m	0.067	0.068	0.069	0.070	0.071	0.073	0.074	0.076	0.078	0.081	0.084	0.087	0.091	0.094	0.097	0.10	0.103	0.106	0.109	0.112	0.115
Normál könyök 90°-os	0.135	0.136	0.138	0.140	0.142	0.145	0.148	0.152	0.156	0.162	0.168	0.174	0.182	0.188	0.194	0.20	0.206	0.212	0.218	0.224	0.23
Elzárószerkezet 90°-os	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Labbszelep	12.0	10.0	9.0	8.5	8.0	7.5	7.0	6.5	6.0	5.5	5.2	4.8	4.4	4.0	3.7	3.4	3.1	2.8	2.5	2.2	2.0
Visszatapszelep	22.0	18.0	15.0	12.0	10.0	9.0	8.0	7.0	6.5	6.0	5.5	5.0	4.5	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5

BANYATERVEZŐ IRODA	oszt. sz.	számok sz.	10
Tervező	szek.	számok sz.	5641
Ellenőrző	szek.	számok sz.	5
Ellenőrző	szek.	számok sz.	4230

Dorogi Bányagépgyár.

A házi gyártmányú szivattyútipusok teljesítmény adatai
és löerőszükségletük.

Tipus	Lép- cső	Emelő magasság m	Löerő szükséglet LE	Megjegyzés
480 lit/p	1	25 m	6 LE	60 φ sziv 60 φ ny
	2	50 m	12 "	
	3	75 m	18 "	
2880 ford/p	4	100 m	24 "	145 φ f. kerék
	5	125 m	30 "	
1 m ³ /p	1	60 m	30 LE	100 φ sziv, ny.
	2	120 "	60 "	
	3	180 "	90 "	
2880 ford/p	4	240 "	120 "	215 φ f. kerék
	5	300 "	150 "	
2 m ³ /p	2	160 m	120 LE	150 φ sziv 145 φ ny
	3	(240) 260 m	(155) 200 LE	
	4	(280-300 ")	(200-240 ")	
2880 ford/p	5			250 φ f. kerék
2 m ³ /p	1	25-30 m	25-35 LE	145 φ sziv, 140 φ ny
	2	50-60 "	50-70 "	
	3	75-90 "	75-90 "	
1440 ford/p				300 φ f. kerék
5 m ³ /p	1	55 m	100 LE	220 φ sziv 200 φ ny.
	2	110 "	200-200 LE	
	3	180 "	320 LE	
1440 ford/p	4	240 "	420 "	435 φ f. kerék
	5	(300) "	(525) "	
1520 szivattyú	120 lit/p	1	15 m	10 LE
	500 lit/p	1	20 m	10 LE
				1440 ford/p 40 φ 30 φ 450 φ 50 φ

A táblázatban adott LE.
értékek a szükséges leg-
kisebb teljesítményt jelen-
tik a hajtó motor teljesít-
ménye legalább annyi
legyen.

A megfelelő emelő magasság
ellennyomása nélkül a szivaty-
tú vizszállítására lényeges-
sen megnövekszik a legki-
sebb szükséges teljesítme-
nyű motor túlterhelődhet.

Az alkalmazott motor am-
per felvétele teljesen nyitott
tölőzárnál mindig ellen őri-
zendő.

Dorog, 1951, XI. 13.

TPOC	FHK (Kilohertz)											
	600V KW						3000V KW					
	1000	1200	1400	1600	1800	2000	1000	1200	1400	1600	1800	2000
	1000	1200	1400	1600	1800	2000	1000	1200	1400	1600	1800	2000
142												
143												
147	59	40	25									
153	74	51	35	18	40	20						
156	100	70	49	20	22	55	40					
158	125	94	68	44	33	60	59	44				
160	140	120	81	59	44	110	77	59				
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PMA (Continued)

600V				1000V				1200V				1400V				1600V				1800V			
AW	U ₂	U ₁	U ₂	AW	U ₂	U ₁	U ₂	AW	U ₂	U ₁	U ₂	AW	U ₂	U ₁	U ₂	AW	U ₂	U ₁	U ₂	AW	U ₂	U ₁	U ₂
170																							
230	265	90	160																				
260	26	90	185																				
180	83	180	120	22	150	100	16	140	85	40	700	250	30	135	150								
240	44	190	155	30	155	105	22	140	110	55	100	340	40	135	200								
230	62	245	145	44	147	300	33	135	180	80	180	370	59	215	160	44	200	105					
300	47	240	225	59	147	205	44	135	225	110	180	300	73	245	245	59	200	100					
365	110	320	220	80	285	190	54	250	140	147	235	400	103	250	270	94	280	230	59	200			
400	140	320	280	109	285	250	79	250	210	190	235	520	136	250	350	95	280	205	79	200			
425	185	340	350	180	310	270	95	265	225	260	380	430	185	320	380	130	280	300	82	200			
530	230	340	430	160	310	340	120	285	285	330	380	550	226	320	425	180	280	305	112	200			
660	285	340	540	205	310	430	165	285	360	420	380	700	295	325	610	205	280	400	169	200			

4

1000V			1200V			400V			600V			800V			1000V			1200V		
U ₁	KW	J _a	U ₂	KW	J _a	U ₂	KW	J _a	U ₂	KW	J _a	U ₂	KW	J _a	U ₂	KW	J _a	U ₂	KW	J _a
220	170	40	195	145	96	160	390	68	195	250										
220	225	51	195	185	125	165	500	88	195	335										
220	280	74	245	205	200	320	400	147	275	350	95	230	285	6	200	230	48	195	195	
220	320	92	245	260	250	320	500	185	275	440	120	220	360	85	200	295	63	195	195	
220	400	120	245	340	315	320	635	235	275	560	165	220	460	110	200	380	80	195	195	

Zaner

Klement Gottwald
(Ganz) villor.
Bertul.
4.18.5.1944

FHK és FHA jelű motorok táblázata (Házi használatra)
Ganz árjegyzék alapján.

6101894

4

Vízemelési költségek 200, 300, 400 és 500 m. emelésnél.

Dorog

Számítási adatok

A vill. motor teljesítménye:

$$N_{kw} = \frac{Q \cdot \rho \cdot H_m}{60 \cdot 75 \cdot \eta_{összes}} = 0,735$$

A vízemelés ideje egy évben: 365 nap/év 24 ó/nap = 8760 ó/év

A villamos energia ára Dorogon és Tatabányán: 0,25 Ft./Kwh.

A szivattyú és a motor összhatásfoka $\eta = 0,60$

A szénköltség: 180 Ft./t.

A termelés ideje 300 nap/év

H emelő magasság m	Q vízmeny l/p	Energia fogyasztás Kw/ó	Energia költség		500 t/nap termelésnél		100 t/nap termelésnél		Az energia költség a term.költség %-ában		Megjegyzés
			Ft/ó	Ft/év	Fajlagos energia fogyasztás Kw/ó	Fajlagos energia költség Ft/t	Fajlagos energia fogyasztás Kw/ó	Fajlagos energia költség Ft/t	500 t/nap termelésnél %	1000 t/nap termelésnél %	
200	5000	272,50	68,13	597500	16	4	8	2	2,22	1,11	632
	10000	545	136,25	1195000	32	8	16	4	4,44	2,22	
	15000	817,50	204,38	1792500	48	12	24	6	6,66	3,33	
	20000	1090	272,50	2390000	64	16	32	8	8,88	4,44	
300	5000	408,75	102,2	896250	24	6	12	3	3,33	1,66	
	10000	817,50	204,4	1792500	48	12	24	6	6,66	3,32	
	15000	1226,25	306,6	2688750	72	18	36	9	9,99	4,98	
	20000	1635	408,8	3585000	96	24	48	12	13,32	6,66	
	5000	545	136,25	1195000	32	8	16	4	4,44	2,22	

400	5000	545	Approved For Release 2008/07/28 : CIA-RDP80T00246A000600740001-3							4.44	2.22
	10000	1090	272.50	2390000	64	16	32	8	8.88	4.44	
	15000	1635	408.8	3585000	96	24	48	12	13.32	6.66	
	20000	2180	545	4780000	128	32	64	16	17.76	8.88	
500	5000	681.25	170.3	1493750	40	10	20	5	5.55	2.78	
	10000	1362.50	340.6	2987500	80	20	40	10	11.10	5.55	
	15000	2043.75	510.9	4481250	120	30	60	15	16.65	8.33	
	20000	2725	681.2	5975000	160	40	80	20	22.20	11.10	
600	5000	817.50	204.4	1792500	48	12	24	6	6.66	3.33	
	10000	1635	408.8	3585000	96	24	48	12	13.32	6.66	
	15000	2452.50	613.2	5377500	144	36	72	18	19.98	9.99	
	20000	3270	817.6	7170000	192	48	96	24	26.64	13.32	

5

100. méter fűvel körülvett vadgazdálkodási kiserősség (R. 100)

L	F ₁	3.0	3.2	3.4	3.6	3.8	L	F ₂	4.0	4.2	4.4	4.6	4.8
do cm	m ²	m ²	m ²	m ²	m ²	m ²	do cm	m ²	m ²	m ²	m ²	m ²	m ²
5	15	0.0475	0.0401	0.0339	0.0284	0.0253	5	18	0.0500	0.0425	0.0363	0.0308	0.0278
	18	0.0518	0.0437	0.0372	0.0320	0.0278		20	0.0540	0.0460	0.0395	0.0338	0.0300
	20	0.0542	0.0457	0.0390	0.0336	0.0292		22	0.0565	0.0480	0.0413	0.0354	0.0315
3	15	0.0374	0.0314	0.0265	0.0226	0.0192	3	18	0.0404	0.0340	0.0287	0.0246	0.0215
	18	0.0403	0.0343	0.0292	0.0253	0.0220		20	0.0430	0.0365	0.0310	0.0268	0.0235
	20	0.0422	0.0357	0.0304	0.0262	0.0230		22	0.0455	0.0390	0.0335	0.0292	0.0258
1	15	0.0240	0.0201	0.0174	0.0149	0.0129	1	18	0.0265	0.0225	0.0197	0.0172	0.0150
	18	0.0256	0.0217	0.0185	0.0159	0.0138		20	0.0280	0.0240	0.0210	0.0185	0.0162
	20	0.0262	0.0221	0.0190	0.0164	0.0142		22	0.0295	0.0255	0.0225	0.0199	0.0175
	F ₁	4.0	4.2	4.4	4.6	4.8		F ₂	5.0	5.2	5.4	5.6	5.8
	do cm	m ²	m ²	m ²	m ²	m ²		do cm	m ²	m ²	m ²	m ²	m ²
5	15	0.0219	0.0190	0.0171	0.0150	0.0133	5	18	0.0240	0.0210	0.0190	0.0169	0.0150
	18	0.0239	0.0207	0.0187	0.0164	0.0146		20	0.0260	0.0230	0.0210	0.0188	0.0169
	20	0.0250	0.0218	0.0190	0.0172	0.0152		22	0.0275	0.0245	0.0225	0.0202	0.0182
3	15	0.0162	0.0149	0.0136	0.0120	0.0105	3	18	0.0180	0.0165	0.0150	0.0134	0.0119
	18	0.0183	0.0164	0.0148	0.0128	0.0114		20	0.0195	0.0180	0.0165	0.0148	0.0133
	20	0.0196	0.0177	0.0153	0.0134	0.0119		22	0.0210	0.0195	0.0180	0.0162	0.0147
1	15	0.0113	0.0098	0.0089	0.0079	0.0069	1	18	0.0125	0.0110	0.0100	0.0090	0.0080
	18	0.0120	0.0104	0.0094	0.0084	0.0073		20	0.0135	0.0120	0.0110	0.0100	0.0090
	20	0.0124	0.0108	0.0097	0.0086	0.0075		22	0.0145	0.0130	0.0120	0.0110	0.0100
	F ₁	5.0	5.2	5.4	5.6	5.8		F ₂	6.0	6.2	6.4	6.6	6.8
	do cm	m ²	m ²	m ²	m ²	m ²		do cm	m ²	m ²	m ²	m ²	m ²
5	15	0.0119	0.0107	0.0099	0.0090	0.0082	5	18	0.0130	0.0118	0.0110	0.0100	0.0092
	18	0.0129	0.0116	0.0106	0.0097	0.0089		20	0.0140	0.0128	0.0120	0.0110	0.0102
	20	0.0135	0.0122	0.0111	0.0101	0.0093		22	0.0150	0.0138	0.0130	0.0120	0.0112
3	15	0.0095	0.0086	0.0078	0.0071	0.0065	3	18	0.0105	0.0096	0.0088	0.0080	0.0073
	18	0.0102	0.0092	0.0084	0.0077	0.0070		20	0.0115	0.0106	0.0098	0.0090	0.0083
	20	0.0106	0.0095	0.0087	0.0080	0.0073		22	0.0125	0.0116	0.0108	0.0100	0.0093
1	15	0.0062	0.0056	0.0051	0.0045	0.0041	1	18	0.0070	0.0064	0.0059	0.0053	0.0048
	18	0.0066	0.0059	0.0054	0.0049	0.0045		20	0.0075	0.0068	0.0063	0.0057	0.0052
	20	0.0067	0.0060	0.0055	0.0051	0.0046		22	0.0080	0.0073	0.0068	0.0062	0.0057
	F ₁	6.0	6.2	6.4	6.6	6.8		F ₂	7.0	7.2	7.4	7.6	7.8
	do cm	m ²	m ²	m ²	m ²	m ²		do cm	m ²	m ²	m ²	m ²	m ²
5	16	0.0075	0.0069	0.0064	0.0059	0.0054	5	18	0.0085	0.0078	0.0073	0.0067	0.0062
	18	0.0079	0.0072	0.0067	0.0062	0.0057		20	0.0090	0.0083	0.0078	0.0072	0.0067
	20	0.0082	0.0076	0.0070	0.0065	0.0060		22	0.0095	0.0088	0.0083	0.0077	0.0072
3	16	0.0059	0.0054	0.0051	0.0047	0.0044	3	18	0.0065	0.0060	0.0056	0.0052	0.0048
	18	0.0062	0.0057	0.0053	0.0049	0.0046		20	0.0068	0.0063	0.0059	0.0055	0.0051
	20	0.0064	0.0059	0.0055	0.0051	0.0048		22	0.0070	0.0065	0.0061	0.0057	0.0053
1	16	0.0038	0.0035	0.0033	0.0030	0.0027	1	18	0.0042	0.0039	0.0036	0.0033	0.0030
	18	0.0040	0.0037	0.0034	0.0031	0.0028		20	0.0045	0.0041	0.0038	0.0035	0.0032
	20	0.0041	0.0038	0.0035	0.0032	0.0029		22	0.0048	0.0044	0.0041	0.0038	0.0035

az átlagot, lak közepé közötti távolság.
do cm az átlagot, lak átmérője.



Átlagérték (átlagban) (a 100)

m^2	36	38	1	F_m	40	42	44	46	48
m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2
1.15	0.0286	0.0253	5	16	0.0257	0.0247	0.0044	0.0041	0.0039
1.12	0.0320	0.0278		20	0.0257	0.0241	0.0044	0.0044	0.0041
1.09	0.0336	0.0292		22	0.0256	0.0230	0.0044	0.0046	0.0043
1.06	0.0226	0.0192	3	18	0.0242	0.0208	0.0035	0.0033	0.0031
1.03	0.0253	0.0220		20	0.0242	0.0211	0.0031	0.0035	0.0033
1.00	0.0262	0.0230		22	0.0240	0.0211	0.0031	0.0030	0.0034
0.97	0.0144	0.0129	1	18	0.0237	0.0204	0.0023	0.0021	0.0020
0.95	0.0159	0.0138		20	0.0237	0.0205	0.0024	0.0022	0.0021
0.90	0.0164	0.0142		22	0.0235	0.0206	0.0023	0.0023	0.0022
4	46	48		F_m	8.0	8.2	8.4	8.6	8.8
m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2
1.11	0.0150	0.0133	5	18	0.0233	0.0204	0.0032	0.0031	0.0030
1.07	0.0101	0.0091		20	0.0237	0.0205	0.0033	0.0032	0.0031
1.04	0.0111	0.0101		22	0.0237	0.0203	0.0034	0.0032	0.0032
1.01	0.0100	0.0100	3	18	0.0229	0.0202	0.0028	0.0025	0.0024
0.98	0.0108	0.0114		20	0.0229	0.0209	0.0027	0.0026	0.0025
0.95	0.0134	0.0138		22	0.0229	0.0209	0.0028	0.0026	0.0026
0.92	0.0079	0.0074	1	18	0.0218	0.0207	0.0017	0.0016	0.0015
0.89	0.0084	0.0073		20	0.0218	0.0208	0.0018	0.0017	0.0016
0.87	0.0088	0.0075		22	0.0218	0.0208	0.0018	0.0017	0.0017
56	58	60		F_m	9.0	9.2	9.4	9.6	9.8
m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2
1.09	0.0084	0.0078	5	18	0.0208	0.0204	0.0021	0.0021	0.0020
1.06	0.0097	0.0088		20	0.0207	0.0203	0.0023	0.0022	0.0021
1.03	0.0101	0.0093		22	0.0207	0.0203	0.0024	0.0023	0.0022
1.00	0.0091	0.0085	3	18	0.0207	0.0200	0.0018	0.0017	0.0016
0.97	0.0077	0.0070		20	0.0207	0.0201	0.0019	0.0018	0.0017
0.94	0.0080	0.0073		22	0.0207	0.0202	0.0019	0.0019	0.0018
0.91	0.0075	0.0068	1	18	0.0207	0.0203	0.0012	0.0011	0.0011
0.88	0.0043	0.0045		20	0.0207	0.0203	0.0012	0.0012	0.0011
0.85	0.0051	0.0046		22	0.0207	0.0204	0.0013	0.0012	0.0011
66	68	70		F_m	10.0	10.2	10.4	10.6	10.8
m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2
1.04	0.0059	0.0054	5	18	0.0207	0.0204	0.0017	0.0016	0.0016
1.01	0.0062	0.0057		20	0.0207	0.0204	0.0018	0.0017	0.0017
0.98	0.0065	0.0060		22	0.0207	0.0203	0.0019	0.0018	0.0018
0.95	0.0041	0.0035	3	18	0.0207	0.0204	0.0014	0.0013	0.0013
0.92	0.0049	0.0044		20	0.0207	0.0204	0.0014	0.0014	0.0013
0.89	0.0051	0.0046		22	0.0207	0.0204	0.0015	0.0014	0.0014
0.86	0.0030	0.0027	1	18	0.0207	0.0204	0.0009	0.0009	0.0008
0.83	0.0031	0.0028		20	0.0207	0.0204	0.0009	0.0009	0.0008
0.80	0.0032	0.0029		22	0.0207	0.0204	0.0010	0.0009	0.0009

$$R = \frac{a^2}{b^2} \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$a = a \text{ vágtatás}$$

$$L = a \text{ vágtatás}$$

$$D = a \text{ vágtatás}$$

$$F = a \text{ vágtatás}$$

$$R_{\text{eredő}} = \frac{a^2}{b^2} \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$h = a \text{ vágtatás}$$

$$A = \frac{1}{1 + \frac{a^2}{b^2}}$$

$$R = \frac{a^2}{b^2} \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$R_{\text{eredő}} = \frac{a^2}{b^2} \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$A = \frac{1}{1 + \frac{a^2}{b^2}}$$

$$R_{\text{eredő}} = R \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$A_{\text{eredő}} = \frac{1}{1 + \frac{a^2}{b^2}}$$

$$h_{\text{eredő}} = h \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$A \text{ vágtatás}$$

$$V_{\text{eredő}} = \frac{1}{1 + \frac{a^2}{b^2}}$$

$$A_{\text{eredő}} = A \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$h_{\text{eredő}} = h \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$R_{\text{eredő}} = \frac{R}{1 + \frac{a^2}{b^2}}$$

$$V_{\text{eredő}} = \frac{V}{1 + \frac{a^2}{b^2}}$$

$$h_{\text{eredő}} = R \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$h_{\text{eredő}} = R \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

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$$h_{\text{eredő}} = R \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

$$h_{\text{eredő}} = R \cdot \frac{1}{1 + \frac{a^2}{b^2}}$$

hővezetési tényező
átviteli

$$R = \frac{Q^2}{RQ^2}$$

BANYATERV

10 méteres
vagy több

Változatok

(6)

	7.4 m ²	7.6 m ²	7.8 m ²
7	0.0044	0.0041	0.0039
8	0.0047	0.0044	0.0041
9	0.0049	0.0046	0.0043
10	0.0035	0.0033	0.0031
11	0.0039	0.0035	0.0033
12	0.0039	0.0036	0.0034
13	0.0023	0.0021	0.0020
14	0.0024	0.0022	0.0021
15	0.0029	0.0023	0.0022
16	8.4 m ²	8.6 m ²	8.8 m ²
17	0.0032	0.0031	0.0030
18	0.0033	0.0032	0.0031
19	0.0034	0.0033	0.0032
20	0.0026	0.0025	0.0024
21	0.0027	0.0026	0.0025
22	0.0028	0.0028	0.0028
23	0.0017	0.0016	0.0015
24	0.0018	0.0017	0.0016
25	0.0018	0.0017	0.0017
26	9.4 m ²	9.6 m ²	9.8 m ²
27	0.0022	0.0021	0.0020
28	0.0023	0.0022	0.0021
29	0.0024	0.0023	0.0022
30	0.0018	0.0017	0.0016
31	0.0019	0.0018	0.0017
32	0.0020	0.0019	0.0018
33	0.0012	0.0011	0.0011
34	0.0012	0.0012	0.0011
35	0.0013	0.0012	0.0011
36	10.4 m ²	10.6 m ²	10.8 m ²
37	0.0017	0.0016	0.0016
38	0.0018	0.0017	0.0017
39	0.0019	0.0018	0.0018
40	0.0014	0.0013	0.0013
41	0.0014	0.0014	0.0013
42	0.0015	0.0014	0.0014
43	0.0009	0.0009	0.0008
44	0.0009	0.0009	0.0008
45	0.0010	0.0009	0.0009

$$R = \alpha \frac{L^2}{F^3} \text{ kilométer (km)}$$

α = a várat súrlódási tényezője

L = a várat hossza méterben

D = a várat kerülete (periméter) méterben

F = a várat szabad keresztmetszete a desztől méterben

$$R_{100} = \alpha \frac{100^2}{F^3} \text{ száz fém várat ellátására}$$

h = mm vízszint depresszió, Q = a váraton áthaladó levegő m³/óra

$$A = 0.38 \frac{Q}{F^2}$$

A = ekvivalens szelvény m²-ben

$$R_{100} = \frac{0.144}{R^2}$$

A váratok sorba kapcsolása esetén

$$R_{eredő} = R_1 + R_2 + \dots + R_n$$

$$\frac{1}{A_{eredő}} = \frac{1}{A_1} + \frac{1}{A_2} + \frac{1}{A_3} + \dots$$

$$h_{eredő} = h_1 + h_2 + h_3 + \dots$$

A váratok párhuzamos kapcsolása esetén

$$\frac{1}{R_{eredő}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}$$

$$A_{eredő} = A_1 + A_2 + \dots + A_n$$

Két párhuzamosan kapcsolt várat esetén

$$R_{eredő} = \frac{R_1}{\left(\sqrt{\frac{R_1}{R_2}} + 1\right)^2}$$

$$h_{eredő} = R_{er} \cdot Q_{er}^2 = \left(\sqrt{\frac{R_1}{R_2}} + \sqrt{\frac{R_2}{R_1}}\right)^2$$

Három párhuzamosan kapcsolt várat esetén

$$R_{eredő} = \frac{R_1}{\left(\sqrt{\frac{R_1}{R_2}} + \sqrt{\frac{R_1}{R_3}} + 1\right)^2}$$

n egyenlő ellenállású várat párhuzamos kapcsolása esetén

$$R_{eredő} = \frac{R_1}{n^2}$$

BANYATERV, BUDAPEST	Árta	Árta	Árta
100 méteres fával deszt váratok légellenállása	Árta	Árta	60%
	Árta	Árta	10
	Árta	Árta	10
	Árta	Árta	10
Változatok	Árta	Árta	10

10-45-100

IV-es típusú székelyes vízszintes ábrólátók:

Típus	Ár (Ft)		Súly (kg)		Teljes súly kg
	normál kijelzővel	székelyes kijelzővel	székelyes tábla	székelyes szekrény	
IV. I	510 -	580 -	50	3x3	59
IV. II	1110 -	1240 -	125	3x7	144
IV. III	1830 -	1890 -	222	3x11	256
IV. IV	2300 -	2460 -	260	3x22	322
IV. V	3030 -	4190 -	480	3x50	700

Tablázatok székelyes vízszintes ábrólátókhoz:

Típus	Az ábrólátó tábla adatok		Max. fongóerő áram és feszültség	
	LE	KW	A	V
IV. I	40	30	60	560
IV. II	60	60	200	530
IV. III	160	120	400	1500
IV. IV	380	220	400	1500
IV. V	800	600	600	1500

